

## REMARKS/ARGUMENTS

Claims 1-24 were previously pending in the application. Claims 2 and 14 are canceled; claims 1, 3-4, 12, 15-16, and 24 are amended; and new claims 25-38 are added herein. Assuming the entry of this amendment, claims 1, 3-13, and 15-38 are now pending in the application. The Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and these remarks.

In paragraph 5, the Examiner rejected claims 1, 11-13, and 24 under 35 U.S.C. § 102(b) as being anticipated by Murphy. In paragraph 8, the Examiner rejected claims 8, 9, 19, 20, and 22 under 35 U.S.C. § 103(a) as being unpatentable over Murphy in view of Cooper. In paragraph 9, the Examiner objected to claims 2-7, 10, 14-18, 21, and 23 as being dependent upon a rejected base claim, but indicated that those claims would be allowable if rewritten in independent form. For the following reasons, the Applicant submits that all now-pending claims are allowable over Murphy and Cooper.

### Claims 1, 3-13, 15-21, and 24:

Amended claims 1 and 12 are equivalent to original claims 2 and 14, respectively, rewritten in independent form. Since the Examiner stated that claims 2 and 14 would be allowable if rewritten in independent form, the Applicant submits that claims 1 and 12 are allowable. Since claims 3-11, 13, and 15-21 depend variously from claims 1 and 12, it is further submitted that those claims are also allowable.

Claim 24 is amended to include the language analogous to that of original claim 2. The Applicant submits that the same reasons for allowability that applied to original claim 2 also apply to amended claim 24. It is therefore submitted that amended claim 24 is allowable over the cited references.

### Claims 22-23 and 32-38:

Claim 22 is directed to a device having a Mach-Zehnder interferometer (MZI). The MZI has two arms, one of which has an optical resonator. A section of the resonator has a functional layer adapted to bind an analyte, wherein the optical characteristics of the resonator change, when the analyte binds to the functional layer.

On page 4 of the office action, the Examiner admitted that Murphy does not teach a device having an MZI. However, the Examiner stated that Cooper discloses a device having an MZI, while Murphy, in col. 7, lines 1-5, discloses a section of a resonator.

In response, the Applicant directs the Examiner's attention to the fact that, in col. 7, lines 1-5, Murphy talks about a resonant absorption band that is shown, e.g., in Murphy's Fig. 6, and not about an optical resonator. In contrast, Applicant's specification, on page 5, lines 14-16, describes an optical resonator as a structure that is adapted to generate multiple round trips of light within the structure. The Applicant submits that Murphy does not disclose such a structure for use in his device.

While it is true that, in paragraph [0107], Cooper describes the use of an MZI in his optical sensor, nowhere in his specification does Cooper teach or even suggest that this MZI (or, for that matter, Cooper's entire optical sensor) somehow incorporates an optical resonator, as explicitly recited in claim 22.

In view of these facts, the Applicant submits that the rejection of claim 22 over Murphy and Cooper is improper and should be withdrawn, and that claim 22 is allowable over Murphy and Cooper.

Since claims 23 and 38 depend from claim 22, it is further submitted that those claims are also allowable over Murphy and Cooper.

New claims 32 and 35 are equivalent to original claims 9 and 20, respectively, rewritten in independent form. Each of claims 32 and 35 explicitly recites an MZI, in which two gratings form an optical resonator. The Applicant submits that the above-specified reasons for allowability over Murphy and Cooper of claim 22 also apply to claims 32 and 35. As such, it is submitted that claims 32 and 35 and their dependent claims 33-34 and 36-37 are allowable over Murphy and Cooper.

Support for new claims 33, 36, and 38 can be found, e.g., on page 5, lines 14-16. Each of claims 33, 36, and 38 explicitly specifies that the two gratings that form the optical resonator are adapted to couple light in and out of the optical resonator and to generate multiple round trips of the light within the resonator. The Applicant submits that Murphy and Cooper, independently or in combination, do not teach or suggest such a feature. This fact provides additional reasons for the allowability of claims 33, 36, and 38 over Murphy and Cooper.

Claims 25-31:

Support for new claims 25-31 can be found, e.g., in original claims 4-7 and 16-18. Independent claims 25 and 29 are substantially equivalent to original claims 4 and 16, respectively, rewritten in independent form. The change in the language of claims 25 and 29 with respect to that of original claims 4 and 16 is made for clarification purposes, and not to avoid any prior art references. The Applicant submits that the same reasons for allowability that applied to original claims 4 and 16 also apply to claim 25 and 29. It is therefore submitted that amended claims 25 and 29 are allowable over the cited references. Since claims 26-28 and 30-31 depend variously from claims 25 and 29, it is further submitted that those claims are also allowable over the cited references.

In view of the above amendments and remarks, the Applicant believes that the now-pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

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